WE CLAIM:

1. A method for assessing a patient for predisposition to total joint replacement failure, comprising the steps of:

a) assaying a patient sample containing monocytes/macrophages by measuring the level at which at least one pro-inflammatory marker is produced in response to incubation with a fixed or varied volume of a particulate form of the joint replacement material;

b) comparing that measured level with either (i) a first reference level established for a population of primary patients or (ii) a second reference level established for a population of revision patients; and

c) wherein a patient is identified as having a predisposition to total joint replacement if (a) the measured level is at least twice the first reference level, or (b) if the measured level is statistically no different from the second reference level, or (c) if the level when measured at said varied particulate volume is characterized by a bell-shaped dose response curve.

2. The method according to claim 1, wherein said levels using said varied volume of the particulate form of the joint replacement material to produce a dose response curve, and identifying patients predisposed to joint replacement failure as those patients for which a bell-shaped dose response curve is generated.

3. The method according to claim 1, wherein the particulate joint material is polyethylene.

4. The method according to claim 1, wherein the pro-inflammatory marker is selected from a cytokine and an enzyme.

5. The method according to claim 4, wherein the pro-inflammatory marker is selected from interleukin-6, interleukin-1B and tumour necrosis factor alpha.

6. The method according to claim 4, wherein the enzyme is TRAP.

7. The method according to claim 1, in which the levels of at least two pro-inflammatory markers are correlated, and compared with said reference levels to identify patients having said predisposition.

8. The method according to claim 1, wherein the level at which the pro-inflammatory marker is produced is measured by detecting the secreted form of that marker.

9. The method according to claim 1, wherein the level at which the pro-inflammatory marker is produced is measured by detecting transcripts of a gene encoding said marker.

10. A kit comprising one or more reagents for performing the assay defined according to any preceding claim, and instructions for assessing said predisposition based on the results of said assay.

11. A kit according to claim 10, comprising an assay substrate pre-loaded with particulate joint replacement material.

12. A kit according to claim 11, wherein said substrate comprises particulate joint replacement material pre-loaded with particulates in a range of different volumes.